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GK-604
Inclinometer Readout
User's Manual

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1. Introduction

The GK-604 is made up of two components:

- the readout which is composed of an Archer Field PC running the GK-604 Inclinometer Readout software
- the GK-604 remote module which is directly connected to the inclinometer probe and is housed in a weather proof enclosure

Figure 1 - Remote Module (mounted in reel), Archer Field PC and Carrying Case

The two components communicate wirelessly using Bluetooth ®, a reliable digital communications solution. This simplifies the handling of the system in the field as well as simplifying the transfer of data to your PC workstation for final analysis.

1.1 Features

Rugged, general purpose, reliable readout based on an Archer Field PC:

- all the benefits of a Windows compatible device (Windows file system, RS-232, USB and wireless connectivity)
- long battery life
- ease of use

Lightweight and simple remote unit:

- Lithium battery (8 + hours of continuous use)
- one button operation; automatic power down when Bluetooth connection is dropped or after several minutes of inactivity
- rugged
- reliable connection to standard inclinometer probes
- firmware upgradeable in the field

1.2 Before using the GK-604 Readout software

The readout software runs as an application under Windows Mobile 5 or 6 operating system installed on an Archer Field PC.

- Please familiarize yourself with the Field PC (see the included CD Reference Manual) and the Windows Mobile OS.

- It is assumed in the instructions below that you can launch applications from the Start button including File Explorer and the Bluetooth Settings manager.

- It is assumed that you can tap the keyboard icon as needed and use the on-screen keyboard to enter text and numbers.

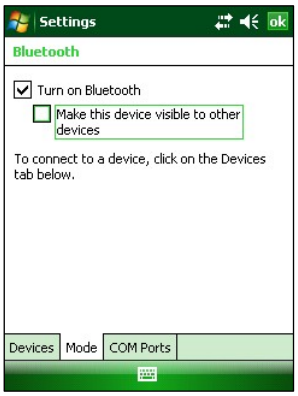
2. Operation

2.1 Establishing contact with the remote.

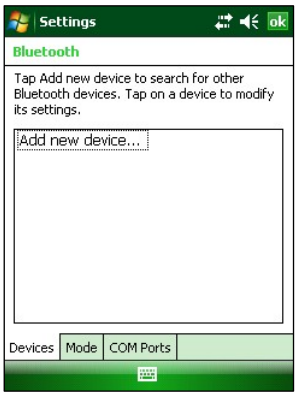
This only has to be done once and is typically done before it leaves the factory. Follow the steps below to ensure the 'partnership' with the remote is established before using the readout software:

1. Use the Bluetooth Settings Manager on the Archer Field PC to set up the link to the remote. Read about setting up a Bluetooth "partnership" in Chapter 9 of the Field PC's Reference Guide.

2. Once in the Bluetooth Settings Manager, click on the "Mode" tab and then make sure that the box next to "Turn on Bluetooth" is checked.



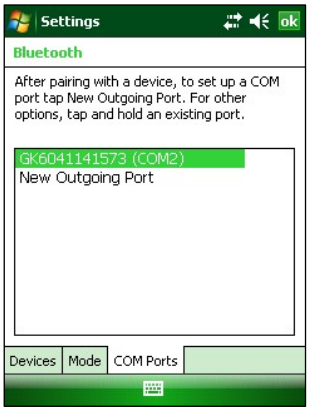
3. Click on the "Devices" tab. If it shows a "Geokon" device (name will start with "GK" and contain the remote's serial number), go to the next step. Otherwise turn on the remote module (should see a flashing blue indicator on the remote) and select "Add new device...".



4. When a suitable remote is discovered, highlight the device and click Next.

5. A prompt will be displayed for a password; enter “default” and press Next again. If a partnership with the device is successfully established the screen will momentarily display the prompt to the right and then return to the Bluetooth Devices screen.

6. Click on the COM Ports tab. If the “Geokon” device is already assigned to a COM Port, the partnership process is finished. If not, select “New Outgoing Port” and select an available COM port (COM5 is the default). Be sure to remember the number of the COM port as you may have to select it later in the readout software (see section 2.2).


Settings
ok
Bluetooth
After pairing with a device, to set up a COM port tap New Outgoing Port. For other options, tap and hold an existing port.
GK6041141573 (COM2)
New Outgoing Port
Devices
Mode
COM Ports

2.2 Using the GK-604 Readout Software

The readout software can be launched by tapping the Start button and selecting it from the drop down list or clicking on Programs and then clicking the G icon. After launch the main (opening) screen is displayed (see figure 2):

Figure 2 - Main screen

If at launch, the application displays the error shown in figure 3, then the following options should be considered:

- Make sure the remote is turned on (blue light blinking).
- Select the "System" option and "Connect to Remote" again (if no previous connection, assumes COM5 has been set up as an outgoing port in the Bluetooth Settings Manager) or select the "Alternate Connect" option (see figure 4) and pick the COM port previously established in section 2.1.

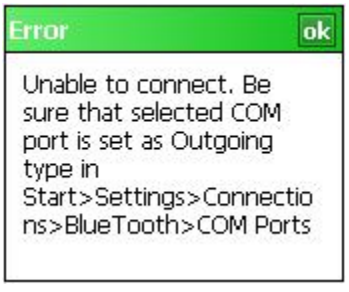

Error
ok
Unable to connect. Be sure that selected COM port is set as Outgoing type in Start>Settings>Connections>BlueTooth>COM Ports

Figure 3 - Connection Error

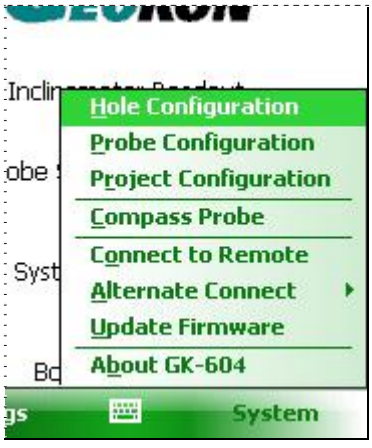


Figure 4 - System Menu

A successful connection is reflected in the Main Screen status as in figure 5. At this point readings can be taken by clicking “Readings→Live Readings” (see figure 6). After an initial connection, subsequent connections should happen automatically provided the remote is powered on before launching the GK-604 Inclinometer Readout application.

Figure 5 - Probe Connected

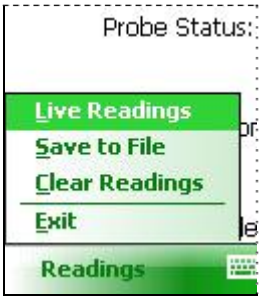


Figure 6 - Readings Menu

The “Live Readings” screen appears as in figure 7:

- Readings are continuously updated from the remote. The ‘Data Set’ always starts with ‘Set 1’ but can be switched at any time to ‘Set 2’ (usually after rotating the probe 180 degrees).
- At the start of a survey, the ‘level’ is set to the “Starting Level” configured for a particular hole. Pressing the “Record” button (with a finger or tap of the stylus) records that set of A&B values and automatically changes the ‘level’ (on screen) by the an amount based on the hole configuration (see section 3.1). The ‘Record” option can also be activated by pressing the “Enter” key on the keypad.
- Be sure to move the probe to the new level and wait for the readings to stabilize before recording the next reading.
- A “beep” sound should be heard, confirming that the reading has been stored. If no beep is heard, tap the “volume” control at the top of the screen and adjust the volume.
- At any point you can scroll the ‘level’ using the Up/Down buttons on the screen and view data stored and checksums (lower half of the screen).

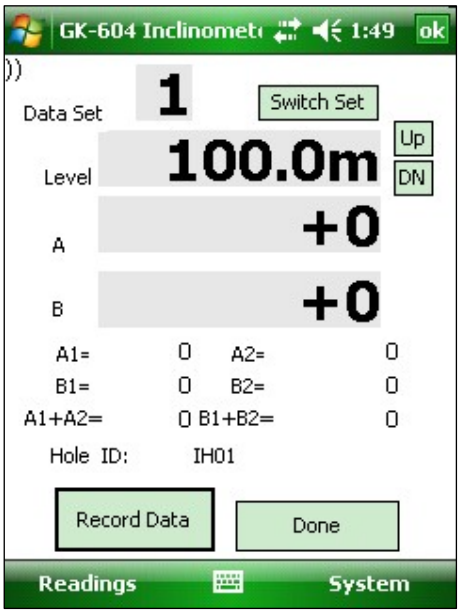


Figure 7 - Live Readings Screen

- When done taking readings, press Done. You will be given the option to save the reading to a file (see figure 8).

  - Even if you select **No**, the readings are not lost and you can choose to save later using the "Readings→Save to File" option from the main screen. The Readings will only change if you go back into Live Readings (and record new ones over the old) or select "Readings→Clear Readings" from the main screen.

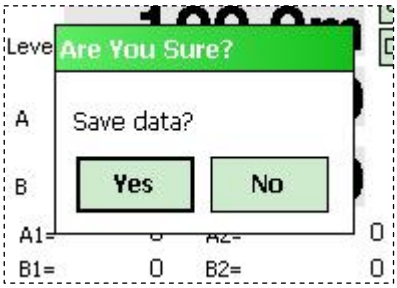


Figure 8 - Save data confirm

  - If **Yes** is selected, you then will be given the choice of saving with the auto-increment suffix on the standard filename (see figure 9). Selecting Yes again causes the save operation to be carried out using a filename of the form: *[Hole_ID][3 digit AutoIncr_Suffix].GKN*

  - If you select **No** (to the auto incrementing option) you will be shown the standard **File Save As** screen and you can modify the file name to anything you choose. Use the stylus to click on the keyboard icon (bottom) and make the changes you desire (see figure 10).

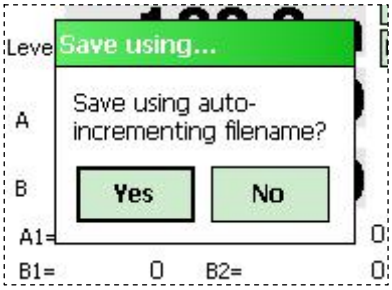


Figure 9 - Auto-increment save

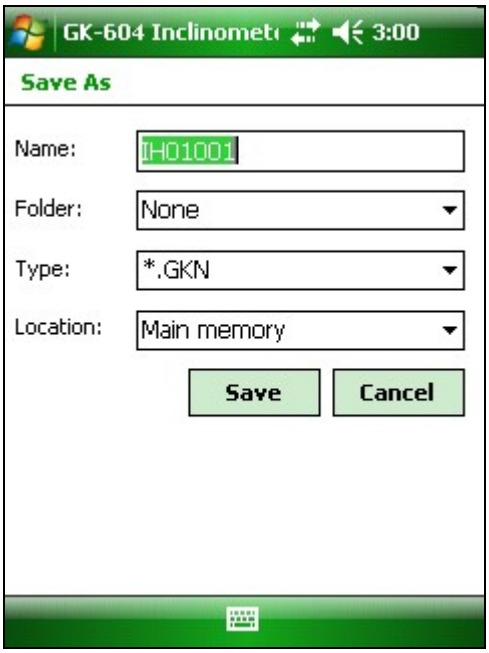


Figure 10 - File Save As Screen

2.3 Exiting the Program

The 'Close Window' [X] in the upper left corner of the display screen does not stop the program, it only pauses the operation and hides the program. This can be a problem as it leaves the Bluetooth connection active (eventually the remote will time out and shut off). This option retains any readings that haven't been saved to a file (simply re-activate the GK-604 program and pick up where you left off).

Selecting the "Readings→Exit" option from the main screen forces everything off and ensures a clean start the next time. **This option will cause readings to be lost** if they have not been saved to a file (see section 2.2, figures 8 and 9 for information regarding saving data).

3. Configuring Holes, Probes, and Projects

Parameters such as English/metric units, initial level of hole, and gage factors can be adjusted to meet user's needs and the specifications of the probe. The software currently supports 2 different probe types, up to 12 different probe configurations and as many hole configurations as the Field PC can store in memory. All these can be adjusted using 3 options on the System menu.

3.1 Hole Configuration

Select **System→Hole Configuration** and the screen depicted in figure 11 will be displayed:

- **Hole ID**
  Tap on the keyboard icon (bottom of the screen) to bring up the on-screen keyboard. Use it to edit the Hole ID (name).

- **Probe Number**
  Select the Probe Number (or name) from the drop down list. This associates a hole with a particular probe. Pressing "Options" takes you directly to the Probe Configuration screen (see section 3.2)

- **Starting Level**
  Using the on-screen keyboard, enter a value for the initial level of the survey for this hole.

- **Interval**
  Tap the radio button corresponding to the interval that will be used for the survey

- **Save**
  The configuration should be saved (A file will be created using the Hole ID name).

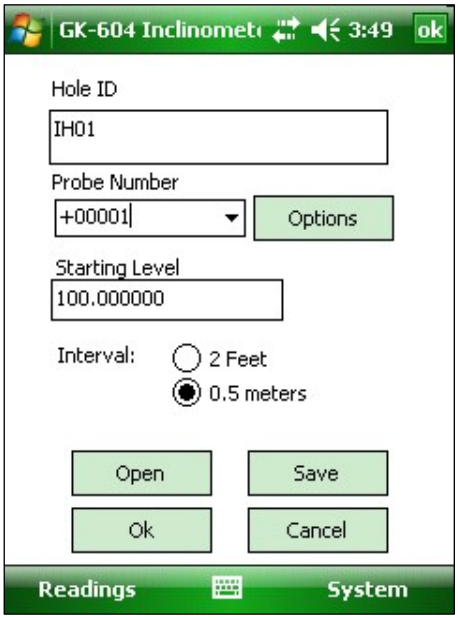


Figure 11 - Hole Configuration

- **Open**
  Press "Open" to view and select any previously saved hole configurations (see figure 12).

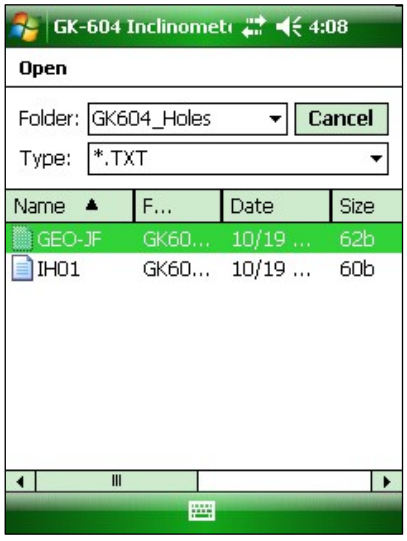


Figure 12- Hole Configuration File Selection

3.2 Probe Configuration

Select **System→Probe Configuration** and the screen depicted in figure 13 will be displayed:

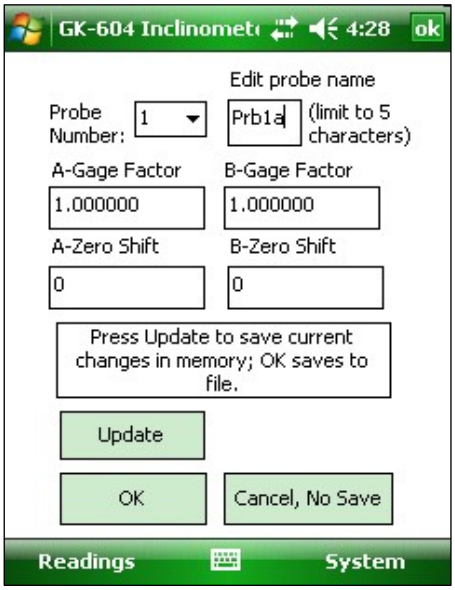


Figure 13 - Probe Configuration

- **Probe Number**
  Use the drop-down list to select 1 of 12 probes

- **Edit probe name**
  Use the on-screen keyboard to enter a friendly name

- **A and B Channel Gage Factors**
  Using the on-screen keyboard, enter appropriate numbers for the 2 gage factors (see the Inclinometer Probe manual and Calibration sheet for more information)

- **A and B Channel Zero Shift**
  To compensate for any offset at zero enter appropriate values for the Zero Shift values (see the Inclinometer Probe manual and Calibration sheet for more information)

- **Update**
  Tapping "Update" causes the information to be temporarily used for the current set of readings (you'll see the effect when you go to "Live Readings" and the readings which are saved in this session").

- **OK**
  Tapping "OK" updates the current session and saves the information to the probe configuration file (so it can be used in future sessions).

3.3 Project Configuration

Select **System→Project Configuration** and the screen depicted in figure 14 will be displayed:

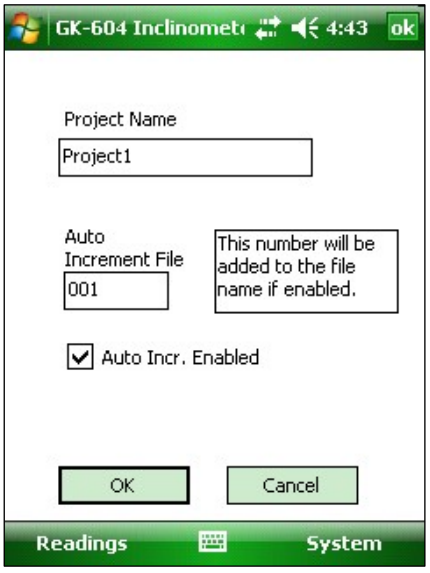


Figure 14 - Project Configuration

- **Project Name**
  can be changed and is stored in the data file.

- **Auto Increment File**
  The 3 digit value in this entry is added as a suffix to data file names automatically if the **Auto Incr. Enabled** box is checked. The 3 digit value is automatically adjusted after every file is saved and the value shown is the current value to be used. You can lower this value to force overwrites of previously saved files, or raise the value to skip file names.

- **OK**
  Tapping "OK" updates the current values and saves the information to the auto configuration file.

3.4 Compass Probe

Select **System→Compass Probe** and the dialog box depicted in figure 15 will be displayed:

Figure 15 - Compass Probe Confirm

- Selecting **Yes** will rescale the software to properly display 0-360 degrees on the **Live Readings** screen. The "type" on the Main Screen will reflect that a Compass Probe has been selected (see figure 16).
  - The software is designed to work only with the Geokon 6005-3 Spiral Indicator Probe.
  - Only one channel (A) is read and displayed on the **Live Readings** screen (see figure 17). Only the A1 readings are stored in the data file.
- To discontinue the use of Compass Probes, you must exit the **Live Readings** screen, select **System→Compass Probe** again, and answer **No** at the prompt (see figure 15).

Figure 16 - Compass Probe selected

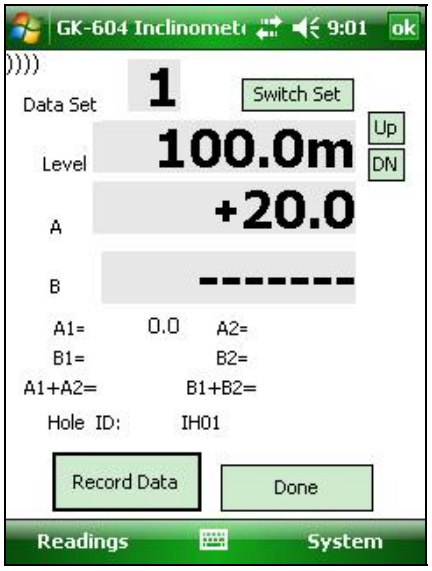


Figure 17 - Live Compass Readings

4. Files, Folders, Transferring Data, Software Updates

There are several types of files in use with this software: hole configuration files, probe configuration files, GTilt data files, firmware update, and setup files. The software assumes the following:

Purpose	***Assumed Folder***	***Filename***	***File Extension***
Hole Configuration	\My Documents\GK604_Holes\	User specified in the Hole Configuration window.	.TXT
Probe Configuration	\My Documents\GK604_Probes\	GK604PROB	.TXT
Initialization File	\My Documents\	GK604INIT	.TXT
Auto Increment Parameters	\My Documents\	GK604AUTO	.TXT
GTilt Data files (saved readings)	\My Documents\	User specified when the Save Readings option is selected.	.GKN
Firmware Update (for remote unit)	\My Documents\	GK604_RFW	.S19
Installation File (for the GK-604 readout software)	\ (root folder)	GK604_Setup	.CAB

Table 1 – Folder paths and File Names

4.1 File Transfer

In general, the only files that will have to be transferred are the GTilt data files, although archiving the others on a "master" PC is recommended. In either case this is easily accomplished several different ways. Connecting the Field PC to a desktop or laptop PC using the supplied USB cable (Type A to mini B) is straight forward and allows the user to view the Field PC's storage as a flash drive on the desktop/laptop; you can then simply drag the files around to any folder on the desktop/laptop.

- If you are using Windows XP you will need to download and install the program, "ActiveSync". This application is available for free from the Microsoft site (www.microsoft.com and search for "Active Sync download"). Once installed (generally requires a reboot), simply connect the USB cable from the Field PC and then open "My Computer" on the XP machine and see a "PDA" entry under drives. Just double click on it to see the folders in the Field PC.

- If you are using Windows Vista or Windows 7, they include software called Windows Mobile Device Center and you should be able to immediately connect the Field PC and see it in the "Computer" window.

It is not necessary to set up any 'syncing' options although it can easily be accomplished. Another Bluetooth partnership can also be set up from your desktop/laptop (assuming they have Bluetooth modules) to the Field PC and transfer files that way.

All of these options (and more) are described in the Field PC's Reference Guide.

4.2 Updating Firmware

This section describes how to download new firmware revisions to the GK-604 Remote Module. If a firmware update is needed, new update files (GK604_RFW.S19) are typically available from Geokon via email or by downloading from the Geokon web-site. The steps below describe the firmware update procedure:

- This file needs to be transferred to the \My Documents folder of the Field PC (using any strategy described above).

- Turn on the remote and make sure its battery is charged (or it is powered externally). A power supply interruption during a firmware update will make it more difficult to complete the update in the field and may require sending the unit back to Geokon.

- With the GK-604 readout software running, select **System→Update Firmware** and follow the on-screen instructions. It takes several minutes to complete the update, so don't turn off the Field PC or the remote unit.

4.3 Installing updated GK-604 Readout Software

As new versions of the GK-604 Inclinometer Readout software become available they will be posted to Geokon's web-site. The installation will overwrite the old program, but will not destroy any of your saved data or configuration files. If in doubt, and as a matter of good computer technique, take the time to back up critical data and configuration files BEFORE installing the new software.

- This file needs to be transferred to the root (\) folder or the \My Documents folder of the Field PC (using any strategy described in section 4.1).

- On the Field PC, tap the Start button and then select File Explorer. Navigate to the location of the setup file and tap it.

- Confirm that you want to install the new program and follow any on-screen instructions.

After the installation is complete you should be able to simply launch the GK-604 software from the start menu.